

# CONVEYOR CONVERSION KIT FOR REPLACING ROLLERS WITHIN A CONVEYOR SYSTEM AND METHOD

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## **RELATED APPLICATION:**

The present application claims the benefit under title 35 United States Code, Section ii 9(e) of United States provisional application Number 60/429,491 filed November 29, 2002 entitled " CONVEYOR SYSTEM AND CONVEYOR CONVERSION KIT FOR REPLACING POWERED ROLLERS WITHIN A CONVEYOR SYSTEM".

## **BACKGROUND OF THE INVENTION**

### **1. Field of the Invention**

The present invention relates generally to convertible conveyor systems, and more particularly it relates to a conveyor conversion kit for replacing rollers within a roller conveyor system or within a roller supported belt system with an elongated smooth supporting surface for a motor powered endless belt. It also relates to the resulting converted conveyor system, and also to the method of replacing roller conveyors to convert the conveyor system to a motor powered endless belt conveyor.

### **2. Description of the Prior Art**

Roller conveyors are commonly used to provide a conveying surface for a variety of items. Typical roller conveyors include a pair of parallel side walls, or beams, or side rails or rails joined by a series of spaced apart connector bars to form a rigid frame. In between the parallel side walls a plurality of spaced cylindrical rollers are supported. The topmost portions of the rollers define a conveying plane on which to-be-conveyed items are placed and rolled.

To meet changing conveying demands, motor-driven or powered endless belt roller conveyors are often used. Because the rollers in existing conveyors were already in place, it was common practice to use as many of the existing rollers as possible to support a powered endless belt. That is, an endless belt was merely installed on a roller conveyor frame with the rollers acting as the primary supports for the top of the movable endless

1 belt. Typically, such endless belt powered conveyor systems still included the rigid  
2 frame formed from a pair of parallel side walls joined by a series of spaced apart  
3 connector bars, with the parallel side walls still carrying a plurality of spaced rollers to, as  
4 noted above, supports for the top of a movable endless belt.

5 Typically, an endless belt conveyor is driven linearly between the side walls of  
6 the frame by one or more motorized drive roller. The motorized drive roller is located  
7 and connected at one or more point along its length of the endless belt conveyor, but is  
8 most generally located in about the center of the conveyor system, but may be connected  
9 at the head or at the tail, i.e. the beginning or end, of the conveyor frame. In the latter  
10 arrangement, the top of the movable endless belt is supported on the top the rollers and  
11 drive roller, or when so located, wraps around a head or a tail drive roller. At the same  
12 time the bottom of the movable endless belt is generally guided by idler or return rollers.

13 It is noted, that in practice these idler or return rollers often extend below the  
14 support frame structures and are sufficiently out in the open to pose various potential  
15 hazards. The exposed idlers or return rollers may pose a significant pinching hazard to  
16 workers, or may catch loose materials or a worker's clothing or appendages between  
17 themselves and the endless belt. These hazards are more pronounced where the idlers or  
18 rollers are in close proximity to a work station area at which location the attention of a  
19 worker may be focused on performing a particular task, and therefore distracted from  
20 safety considerations. In addition, in an operation in which a conveyor belt moves  
21 significant amounts of loose material, such loose materials may adhere to the endless belt  
22 and accumulate at critical locations along the endless belt track, thereby subjecting the  
23 system to significant additional wear and tear, and premature failure. In addition, it is not  
24 unusual for substantial noise to be generated by the rollers and by the endless belt  
25 bouncing up and down on the rollers. Furthermore, over time, individual support rollers  
26 may become worn or otherwise become damaged and need replacement. Replacing  
27 individual support roller is not only expensive, but is time consuming and labor intensive,  
28 and also requires that the conveyor system to be inoperative during the replacement of the  
29 roller, thereby resulting in down time with the non-productive interruption of movement  
30 of conveyed items on the conveyor system.

1           It is noted that in the known prior parent art, Lapeyre , et al., U.S. Patent  
2   6,269,939 teaches a conversion kit and a method for converting a roller conveyor into a  
3   belt conveyor. The converted conveyor is made from a roller conveyor that has a frame  
4   with two parallel sides supporting a set of parallel rollers at spaced apart locations. A  
5   conversion kit that includes attachment collars that fit around spaced apart selected  
6   rollers, while leaving the rollers in place. So called wearstrip material extends outward  
7   from the attachment collars and overlies groups of consecutive rollers. The wearstrip  
8   material and the collars resting on the rollers form a bed between the sidewalls on which  
9   a conveyor belt is supported. However, the resulting converted belt conveyor has the  
10   shortcomings that the rollers remaining on the frame tend to catch dirt, dust and debris,  
11   and include the possibility of becoming dislodged and falling onto the return portion of  
12   the endless belt, thereby posing the possibility of damaging the belt or other parts of the  
13   system. It is therefore clearly seen that there is a need for a simple, quick and  
14   inexpensive way to convert a roller conveyor into a motor-driven endless belt conveyor  
15   that is substantially free of rollers.

16           In Reatti, U.S. Patent 6,640,966, a support structure for the return section of a  
17   belt conveyor, is taught. The support structure is comprised of serpentine slat elements,  
18   support members for supporting the serpentine elements, and transverse members to  
19   which the support members are coupled. Each serpentine slat element is supported  
20   independently of the others by its own independent support members. The support  
21   members include on their lower edge, mechanisms for snap-coupling them to the  
22   transverse members; the snap-coupling mechanisms being formed in a manner that  
23   enables the support members to be coupled by pressing them onto the transverse  
24   members. The serpentine slat elements extend between the sidewalls of the return section  
25   of a belt conveyor. While this reference does not teach a method for converting a roller  
26   conveyor into a belt conveyor, it does teach a return section of a conveyor that is free of  
27   rollers. However, the resulting return section of a conveyor has the short comings that it  
28   is limited to use at the return section of a conveyor.

29           Accordingly, there exists a need to provide a conveyor conversion kit for  
30   replacing substantially all existing support rollers within a roller conveyor system or

1 within a roller supported belt system with an elongated smooth belt supporting surface  
2 for a powered endless belt conveyor. As detailed below, the preferred support roller  
3 replacement system of the present invention provides a conveyor conversion kit including  
4 modular drop-in style cross supports for such elongated smooth belt supporting surfaces.  
5 It also teaches such cross supports with appropriately modified compatible return rollers.  
6 It also teaches drop-in drive head and tail motors, and more, as detailed below. It also  
7 teaches the resulting converted conveyor system, and also teaches the method of  
8 replacing roller conveyors to convert the conveyor system to a motor powered endless  
9 belt conveyor.

#### 11 **SUMMARY OF THE INVNTION**

12 It is therefor an object of the present invention to provide a conveyor conversion  
13 kit for replacing substantially all existing support rollers within a roller conveyor system  
14 or within a roller supported belt system with an elongated smooth belt supporting surface  
15 for a powered endless belt conveyor.

16 It is a further object of the present invention to provide a conveyor conversion kit  
17 including modular drop-in cross supports for elongated smooth belt supporting surfaces.

18 It is another object of the present invention to teach such cross supports with  
19 appropriately modified compatible return rollers.

20 It is yet another object of the present invention to teach drop-in drive head and tail  
21 motors.

22 It is another object of the present invention to teach the resulting converted  
23 conveyor systems.

24 It is another object of the present invention to teach the method of replacing roller  
25 conveyors to convert the conveyor system to a motor powered endless belt conveyor.

26 As noted above, roller conveyors are used to provide a conveying surface for a  
27 variety of items. To meet changing demands, motor-driven or powered endless belt  
28 conveyors are often used. In both conveyor systems rollers are used to support conveyed  
29 items or a powered endless belt, sometimes referred to as a "chain". Both such conveyor  
30 systems, and others include a rigid frame formed from a pair of parallel side walls joined  
31 by a series of spaced apart connector bars, with the parallel side walls carrying a plurality

1 of spaced rollers to, as noted above, supports for the top of a movable endless belt. A  
2 motorized drive roller is located and connected at one or more point along its length of  
3 the endless belt conveyor, but is most generally located in about the center of the  
4 conveyor system, but may be connected at the head or at the tail, i.e. the beginning or  
5 end, of the conveyor frame. In this arrangement, the top of the movable endless belt is  
6 supported on the top the rollers and the bottom of the movable endless belt is generally  
7 unsupported.

8 In the practice of present invention, an endless loop belt conveyor system is  
9 produced from a roller conveyor or a powered endless belt roller conveyor using the  
10 conversion kit of the present invention. It is noted that in such conveyor systems the  
11 parallel side walls have a distance between them. The conversion kit includes at least one  
12 endless loop belt conveyor guide, and at least two conveyor guide mounts, both as  
13 described and defined herein.

14 In preferred embodiments, the endless loop belt conveyor guide is is substantially  
15 linear and substantially flat. The belt conveyor guide includes a smooth, non-moving  
16 upper surface designed to support and guide an endless loop belt for movement around  
17 the conveyor system without the need for rollers. The belt conveyor guide is preferably  
18 made of or coated with a smooth hard polymer; such as acetyl, polyethylene, high density  
19 polyethylene, nylon or the like; although wood, ceramic or metal materials may be used  
20 for the same purpose. Each endless loop belt conveyor guide may be of any length, so  
21 long as it can span the distance between two conveyor guide mounts, although a single  
22 endless loop belt conveyor guide having a length that extends between the head and tail  
23 of the frame is preferred. It is noted that in each conveyor systems the parallel side walls  
24 of the frame have a finite distance between them. Each endless loop belt conveyor guide  
25 has a width dimension, said loop belt conveyor guide width dimension being less than the  
26 distance between a pair of generally parallel side walls of a conveyor frame, and the  
27 endless loop belt conveyor guide is not connected to the side walls of the conveyor frame.  
28 In the alternative, and as the preferred embodiment, the endless loop belt conveyor guides  
29 may include two or more adjacent belt conveyor guides.

30 The conveyor guide mounts are designed to be supported in spaced apart relation  
31 by attachment to the pair of generally parallel side walls of the conveyor frame. Any two

1 or more conveyor guide mounts are suitable to supporting a loop belt conveyor guide.  
2 Each conveyor guide mount include an upper yoke portion having a width dimension  
3 substantially the same as the distance between the pair of parallel side walls of the  
4 conveyor frame, the yoke portion being designed to be connected to and be supported by  
5 the parallel side walls of the conveyor frame. Each conveyor guide mount includes a U –  
6 shaped frame connected to and supported by and below said upper yoke portion. Each U  
7 – shaped frame portion of said conveyor guide mount includes a freely rotatable return  
8 roller for supporting and guiding the return portion of an endless loop conveyor belt.

9 As noted above, substantially all of the rollers are removed from the rigid frame.  
10 This allows a motor driven roller, as part of the conversion kit, to be dropped in at the  
11 head portion or at the tail portion of the frame. Similarly, this also allows an idler roller,  
12 as part of the conversion kit, to be dropped in at the opposed tail portion or head portion  
13 of the frame.

14 In the practice of the present invention, the conversion kit for converting a roller  
15 conveyor that includes a frame having two generally parallel sides and had originally  
16 carried a plurality of rollers at spaced apart locations between the parallel sides into an  
17 endless loop belt conveyor, the frame having a head portion and a tail portion, the kit  
18 including at least one endless loop belt conveyor guide; and at least two conveyor guide  
19 mounts for use as described above. Again, in the alternative, and as the preferred  
20 embodiment, the endless loop belt conveyor guides may include two or more adjacent  
21 belt conveyor guides. In addition, the conversion kit may include a motor driven roller  
22 designed to be dropped in at the head portion or at the tail portion of a frame. Similarly,  
23 the conversion kit may include an idler roller designed to be dropped in at the head  
24 portion or at the tail portion of the frame.

25 The method for converting a roller conveyor that had includes a frame having two  
26 parallel sides and originally supporting a plurality of rollers at spaced apart locations  
27 between the parallel sides along the frame, into an endless loop belt conveyor free of  
28 rollers, and when the frame includes a head portion and a tail portion includes several  
29 steps. First, usually substantially all of the plurality of rollers originally located between  
30 the parallel sides along the frame are removed. Then, at least two conveyor guide mounts  
31 are connected between the parallel sides of the substantially roller free frame at spaced

1 apart locations. Each conveyor guide mount including a smooth, substantially non-  
2 moving linear upper surface to define a support conveyor bed for guiding an endless loop  
3 belt conveyor for movement without rollers. In practice, an endless loop belt conveyor  
4 may then be installed around the conveyor frame. Where desired, a motor driven roller  
5 may be dropped into the head portion or the tail portion of the conveyor frame.  
6 Similarly, an idler roller may be dropped in at the head portion or at the tail portion of the  
7 frame.

8         These and other objects of the present invention will become apparent to those  
9 skilled in the art from the following detailed description and accompanying drawings,  
10 showing the contemplated novel construction, combination, and elements as herein  
11 described, and more particularly defined by the appended claims, it being understood that  
12 changes in the precise embodiments to the herein disclosed invention are meant to be  
13 included as coming within the scope of the claims, except insofar as they may be  
14 precluded by the prior art.

#### 15 16 **BRIEF DESCRIPTION OF THE DRAWINGS**

17         The accompanying drawings, which are incorporated in and form a part of  
18 this specification, illustrate complete preferred embodiments of the present invention  
19 according to the best modes presently devised for the practical application of the  
20 principles thereof, and in which:

21         FIG. 1 is a top perspective view, partially cut away illustrating a conveyor system  
22 produced using the conversion kit and carrying an endless conveyor belt all in accordance  
23 with the present invention;

24         FIG. 2 is an exploded top perspective view illustrating the conveyor produced  
25 using the conversion kit in accordance with the present invention, and in which the  
26 support rollers have been removed from the frame;

27         FIG. 3 is an enlarged front elevational view, partially in cross-of a portion of the  
28 conveyor conversion kit of the present invention as shown in FIGS. 1 and 2, and  
29 illustrating the details of a guide mount carrying a belt conveyor guide and also including  
30 a freely rotatable return roller;

1           FIG. 4 is a side elevational view of the conveyor system of FIGS. 1 and 2  
2 including the conversion kit of the present invention; and.

3           FIG. 5 is a top perspective view, partially cut away, similar to FIG. 1, illustrating  
4 a modification of the conveyor system of the present invention;

5  
6           **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

7           First, referring to FIG. 2, for purposes of orientation an exploded view of a to-be-  
8 converted conveyer system, designated generally as 10, is shown according to the present  
9 invention. As detailed below, converted conveyer system 10 is to-be converted from a  
10 roller conveyer or motor-driven or powered endless belt roller conveyer system, herein  
11 collectively referred to as a "roller conveyer". This leaves converted conveyer system 10  
12 with standard roller conveyer elements such as a pair of substantially parallel side beams  
13 or walls 12 and 14. In preferred embodiments side beams 12 and 14 are connected at  
14 their lower edge portions by a number of spaced apart connector bars 16, thereby forming  
15 a rigid frame 18, much as the frame of a standard roller conveyer system. However, in  
16 the converted conveyer system 10 of the present invention, substantially all of the rollers  
17 19 have been removed from frame 18, as shown, thereby leaving substantially no rollers  
18 19 carried between parallel side beams 12 and 14 of frame 18. It is noted that there is a  
19 given lateral distance between the pair of generally parallel side beams 12 and 14. The  
20 lateral distance between beams 12 and 14 is selected to be sufficient to accommodate an  
21 endless loop conveyor belt 20, see FIGS 1 and 5, and the items to be conveyed by  
22 conveyor system 10.

23           Referring again to FIG. 2, the conversion kit of the present invention is shown in  
24 exploded relation to frame 18. The conversion kit includes, at a minimum, two or more  
25 conveyor belt support and guide mount elements 22 and at least one upper conveyor belt  
26 guide support element 24. The upper belt conveyor belt support and guide 24 is  
27 preferably made of or coated with a smooth hard polymer; such as acetyl, polyethylene,  
28 high density polyethylene, nylon or the like; although wood, ceramic or metal materials  
29 may be used for the same purpose. As detailed below, conveyor belt support and guide  
30 mount elements 22 extend orthogonally between and are connected to and supported by  
31 beams 12 and 14. Conveyor belt guide support element 24 extends in a longitudinal



1 orientation between side beams 12 and 14, but out of contact with beams 12 and 14. In  
2 the practice of the present invention two or more conveyor belt support and guide mount  
3 support elements 22 are dropped into and connected to side beam 12 and 14 of rigid  
4 frame 18 in spaced apart relation by bolts, screws, or any other suitable connecting  
5 elements, not shown in detail.

6 In preferred embodiments each conveyor belt support and guide mount support  
7 element 22 includes an upper yoke portion 26 having a lateral width dimension that is  
8 substantially the same as the lateral distance between parallel side beams 12 and 14. As  
9 noted above, each yoke portion 26 is designed to be connected to and supported by side  
10 beams 12 and 14, thereby in turn supporting the rest of the conveyor belt support and  
11 guide mount element 22, set forth in greater detail below.

12 At least one endless loop belt conveyor belt support and guide support element 24  
13 is carried by and attached to the upper yoke portion 26 of at least two adjacent guide  
14 support elements 22. Each endless loop belt conveyor belt support and guide includes a  
15 substantially smooth, stable, substantially flat non-moving upper surface designed to  
16 support and guide an endless loop conveyor belt 21 for movement around converted  
17 conveyor system 10 substantially without upper support rollers 19.

18 Now referring to FIGS. 1, 2 4 and 5, each frame 18 has a head portion, generally  
19 32, and a tail portion, generally 34. As optional, but preferred elements of the conversion  
20 kit of the present a motor driven roller section 40 and/or an idler roller section 41 may be  
21 included as a part of the conversion kit. In FIG. 2, the motor driven roller section 40 is  
22 shown as having an axle 42 rotatably mounted on a pair of opposed plates 43 and  
23 dropped in at the head portion 32 of frame 18. Plates 43 are designed to be connected to  
24 and supported by side beams 12 and 14. A pair of rollers 44 is connected to axle 42 for  
25 rotation with axle 42. A portion of axle 42, not shown, extends through one of the plates  
26 43, as shown, and is connected through slots 52 to clutched by transmission member 48.  
27 Motor 50 is operatively connected to transmission member 48, and axles 42 extend. A  
28 drive roller section 40 mounted on plates 55 and connected to and supported by the left  
29 end of side beams 12 and 14 is also shown in FIG. 2.

30 As further shown in FIG. 2, idler roller section 41 is comprised, like motor driven  
31 section 40 of one or more axle freely rotatably mounted on a pair of opposed plates.

1 Again, like motor driven section 40, one or more roller sprockets is connected to each  
2 axle for rotation with each axle. The operation of drive roller section 40 and idler roller  
3 section 41 is detailed below. Conventional roller bearings are used with the drive roller  
4 section 40 and idler roller section 41 systems as is known in the art.

5 Now referring to FIG. 3, guide mount 22 is shown in greater. As shown, guide  
6 mount 22 is comprised of a base 62 to which upper yoke 26 is attached by any suitable  
7 mechanical or metallurgical mode, although yoke 26 may be integral with base 62.  
8 Connected to and depending from base 62 are a pair of opposed, articulated support  
9 elements 64. A return roller 66 is freely rotatably supported by each of the opposed  
10 articulated supports 64. Depending from and supported by each articulated support 64 is  
11 a U-shaped protective casing 68. In this preferred embodiment, the axles of belt return  
12 roller 66 also extend through and are rotatably supported by the upwardly extending  
13 opposed legs 70 of U-shaped casing 68. As will be appreciated, casing 68 substantially  
14 surrounds return roller 66 to provide protection to workers and items in the vicinity of  
15 return roller 66 to thereby keep them from getting snagged or pinched by return roller 66.

16 Also shown in FIG. 3, is a cross-sectional view of belt guide support element 24.  
17 In this preferred embodiment belt guide support element 24 includes a support base 72  
18 and a pair of belt supports guide beams 74. As further shown in FIGS. 1 - 4, endless loop  
19 belt conveyor belt support and guide 74 is in the form of two or more laterally adjacent  
20 belt conveyor belt support and guide beams 74. Such two or more adjacent belt conveyor  
21 belt support and guides beams 74 are preferably substantially linear and longitudinally  
22 oriented between side beams 12 and 14. Guides beams 74 have a smooth upper surface  
23 and are substantially flat. Any number of belt guide support element 24 may be used in  
24 the converted conveyor system, but in preferred embodiments a single continuous belt  
25 guide support element 24 is used. The belt guide support element 24 has a lateral width  
26 dimension that is less than the lateral distance between parallel side beams 12 and 14 of  
27 conveyor frame 18. Furthermore, belt guide support element 24 is stably supported by  
28 two or more adjacent belt guide supports elements 22 and is not connected to or  
29 supported by side beams 12 and 14.

30 Belt guide support element 24 supports an upper portion of an endless loop  
31 conveyer belt 20, as shown in FIGS. 1 and 5 and in phantom in FIG. 4. The lower or

1 return portion of belt 20 is supported and guided by return roller sprockets 66 as shown in  
2 FIG. 4, and in phantom in FIG. 5. In addition, since each endless loop conveyor belt 20  
3 has a consistent upper surface height for transfer to adjacent non-converted conveyor  
4 systems having endless loop conveyor belt 20 of the same height without adversely  
5 affecting the flow of goods between adjacent conveyor systems. Endless loop conveyor  
6 belt 20 is preferably composed of a smooth flexible material that slides easily over the  
7 elongated upper surface of belt guide element 24.

8 As previously noted, in one preferred embodiment of the present invention, motor  
9 driven section 40 and idler section 41 are used to replace any existing motor or idler  
10 section after they are removed from a roller conveyor. Motor driven roller section 40 and  
11 idler section 41 are both designed to be "dropped in" as systems that are compatible  
12 with driven endless loop conveyor belt 20. In practice, the support plates 43 and 55 and  
13 axles 42 are pre-aligned so that when they are dropped in to frame 18 they automatically  
14 align with one another and with frame 18 without the need to use extensive time or effort  
15 to align them.

16 In one variation of the present invention as shown in FIGS. 1, 4 and 5, return  
17 roller section 41 is shown at the head of frame 18 and drive roller section 40 and its  
18 associated transmission member 48 and motor 50, are shown at the tail of frame 18. As  
19 part of the present invention, it should be understood that once rollers 19 and any original  
20 drive system have been removed from frame 18 of a roller conveyor that as a part of the  
21 conversion kit and method of the present invention a new drive system section 40 and or  
22 return system section 41 can be dropped into either the head or tail portion of frame 18.  
23 While not critical to the present invention, the replacement motor driven roller sprocket  
24 section 40, endless loop conveyor belt 20, and idler roller sprocket section 41 may have  
25 any desired finish, say a standard metallic zinc finish, or virtually any color desired,  
26 which thereby can provides the converted system with the appearance of a new system,  
27 not a converted system.

28 It is therefore seen that it is desirable to replace support rollers 19 within a roller  
29 conveyor system with a conversion kit 10 including guide support elements 22 supported  
30 on a smooth belt guide element 24 having a smooth, elongated upper surface, and motor  
31 driven roller sprocket section 40 and idler roller sprocket section 41. Regardless of the

1 elements of the conversion kit that are used, the so converted resulting conveyor system  
2 10 does not have the shortcomings of a state-of-the-art roller conveyor system. The  
3 conversion kit of the present invention is of such a nature and such a design that it may be  
4 installed by in-house personnel or by a specialty team of independent contractors or from  
5 the supplier. It is also to be noted, that when replacing a conveyor roller system its  
6 support structure and electrical power grid may remain in place and untouched, thereby  
7 providing an economical upgrade using preexisting in place portions.

8 In the practice of the present invention, a roller conveyor that includes a frame 18  
9 having two parallel side beams 12 and 14, a head or tail portion 32 and a head or tail  
10 portion 34, and originally supporting a plurality of rollers 19 may be converted it into the  
11 conveyor system of the of the present invention free of rollers 19 in several fast and  
12 simple steps. First, substantially all of the plurality of spaced apart rollers 19 originally  
13 located between side beams 12 and 14 of frame 18 of a roller conveyor system are  
14 removed. Then, at least two guide support mounts 22 are connected between and  
15 supported by side beams 12 and 14 of the now substantially roller free frame at spaced  
16 apart locations. Then at least one conveyor belt guide element 24 having a smooth,  
17 substantially non-moving linear upper surface, in accordance with the teaching of the  
18 present invention, is placed longitudinally between parallel beams 12 and 14 to define a  
19 support conveyor bed for guiding an endless loop belt conveyor 20 for movement without  
20 rollers 19. In practice, an endless loop belt 20 is then installed around the converted  
21 conveyor system. Where desired, motor driven roller sprocket section 40 may be  
22 dropped into the head or tail portion 32 or the head or tail portion 34 of such a converted  
23 conveyor frame. Similarly, idler roller sprocket section 41 may be dropped in at the head  
24 or tail portion 34 or at the head or tail portion 32 of frame 18. When activated by motor  
25 driven roller sprocket section 40, endless loop conveyor belt 20 slides smoothly along the  
26 top of smooth belt guide element 24 without the need for a multiplicity of support rollers  
27 19 below the upper portion of endless loop conveyor belt 20.

28 It will be understood that a roller free conveyor system, such as that described  
29 above as being produced by conversion of a roller conveyor system, may also be  
30 produced as original equipment without a conversion.

1           The conversion kit for power roller conveyor systems of the present invention can  
2 be used to convert any and all types of powered roller conveyor system, and to all types  
3 of configurations, including, but not limited to straight portions, horizontal runs, inclined  
4 and declined portions, curved portions, and spurs. It will be appreciated by referenced to  
5 the FIGS. that the resulting converted conveyor system has only about 5% as many  
6 moving parts, i.e. 95% less moving parts, as the standard powered roller conveyor system  
7 that has been converted, while also concurrently reducing operating noise by about 60%.  
8 Concomitantly, such a converted conveyor system requires less maintenance and less of  
9 an inventory of spare or replacement parts, thereby again reducing costs. Also, because it  
10 requires less maintenance the resulting conveyor system is out of service less often,  
11 thereby avoiding the cost of lost production time. Also, when provided as an original  
12 system, the cost is only about 60% the cost of a comparable state of the art roller conveyor  
13 system.

14           While a conversion kit for power roller conveyor systems has been shown and  
15 described in detail, it is apparent that a conveyor system can be produced in the preferred  
16 converted format, but as an original system, without the need to convert a support roller  
17 system.

18           The foregoing exemplary descriptions and the illustrative preferred embodiments  
19 of the present invention have been explained in the drawings and described in detail, with  
20 varying modifications and alternative embodiments being taught. While the invention  
21 has been so shown, described and illustrated, it should be understood by those skilled in  
22 the art that equivalent changes in form and detail may be made therein without departing  
23 from the true spirit and scope of the invention, and that the scope of the present invention  
24 is to be limited only to the claims except as precluded by the prior art. Moreover, the  
25 invention as disclosed herein, may be suitably practiced in the absence of the specific  
26 elements which are disclosed herein.